

Appl. No.: 09/743,096
Amdt. Dated: December 22, 2005
Reply to Office Action of: September 22, 2005

Amendment to the Drawings:

Two Replacement Sheets of drawings are attached to this reply, those Sheets containing changes to Figs. 1A,1B, 2A,2B, 3, 4 and 6 of the original drawings. All of those figures have been labeled (Prior Art) per the Examiner's instructions. In addition, flow direction 7 in Fig. 6 has been re-labeled as flow direction 4a in response to the Examiner's objection to the drawing under 37 CFR 1.84(p)(4).

Attachment: Replacement Sheets

REMARKS/ARGUMENTS

Claims 1-9, 11-12, and 14-16 remain in this application. Claim 1 is being amended to more particularly define the invention, and claims 10 and 13 are being canceled. The specification is being amended at pages 14 and 16 to meet objections raised by the Examiner relating to the drawings, and two Substitute sheets of drawings amending Figs. 1A, 1B, 2A, 2B, 3, 4 and 6 to correct the errors noted by the Examiner are being submitted. Reconsideration of this application in view of these amendments and the following remarks is respectfully requested.

By way of background, the present invention relates to catalyst-containing wall flow filters for the removal of soot particulates present in diesel engine exhaust gases. The filters of the invention are characterized in that the filter walls are formed of sintered particles and exhibit relatively large pore diameters to allow soot penetration, the sintered particles within the walls are provided with catalyst coatings to promote soot oxidation within the filter walls, and the outlet side walls only of the filters are covered by a thin membrane of small pore size to prevent soot from passing through the filter. The advantageous mode of operation of these filters is explained by the Applicants with reference to Fig. 7 of the drawings at page 16, lines 11-19 of the specification:

This invention relies on [a] very open filter structure, where the gas flow 4 tries to pass the soot particles 2 through with low filtration efficiency. As no well-defined soot cake is generated the soot penetrates into the filter wall and there is no well-defined combustion zone. The combustion takes place inside the filter wall itself, or the combustion zone is on the very grain surface and creates a boundary layer 3 with now same thickness as the filter wall. The boundary layer is only well-defined relative to each wall grain surface and not to the filter wall surface. The membrane 5 on the filter wall outlet side ensures that the trapping efficiency is kept high.

Claims 1-5, 7, and 10-16 of the application directed to the above-described invention have been rejected under 35 U.S.C. §103 as obvious from the combination of EP 0 736 503 to Kondo et al. (Kondo) taken with U.S. Patent No. 4,857,089 to Kitigawa et al. (Kitigawa). With respect, that rejection is traversed for the following reasons.

First, the Applicants' claims are directed to filters having membrane coatings on the outlet side only of the filters. As is evident from the above description, that placement of the membrane is required in order to both allow soot penetration into the filter, and to assure that the soot is trapped in the filter for oxidation rather than to escape from the filter. Kondo et al. do not teach or suggest membrane placement on the outlet side only of the filter.

Secondly, Kondo fails to teach or suggest an open filter porosity in the range 30-200 μ m in combination with an outlet side membrane having a mean pore size in the range of 1-50 μ m. Kondo Fig. 19 shows a filter incorporating coating layers with communicating pores on both sides and within the walls of a filter body, and the communicating pores have pore sizes in the range of 10-60 μ m (paragraph [0028] of Kondo). There is no teaching or suggestion to combine an open filter structure with a soot-trapping membrane on the outlet side only of the filter.

The Examiner cites Kitigawa only to show the placement of coatings on either or both of the inlet and outlet sides of a filter. However, the coatings of Kitigawa do not cover the outlet side of the filter, being limited to 8/10ths of any filter surface, and the porosities of the coatings are not disclosed. Further, the coating layers are relatively thick in order to prevent excessive temperature increases in the filter during soot burn-out (column 4, lines 7-10 of the patent). Thus Kitigawa fails to teach or suggest

providing an outlet side membrane of 0.05-0.4 mm thickness on a filter of coarse porosity that would provide coverage effective to trap particulates within the filter for oxidation by a catalyst therein.

For the above reasons it is respectfully submitted that the subject matter of claims 1-9, 10-12, and 14-16 of the application are patentable over the combination of Kondo with Kitagawa, and should be allowed.

Claim 6 of the application has been rejected under 35 U.S.C. §103 as obvious from the combination of Kondo and Kitagawa applied as above, further in view of U.S. Patent No. 5,041,407 to Williamson. That rejection is respectfully traversed since Williamson fails to teach or suggest those elements of claim 6 that are absent from Kondo and Kitagawa. Although Williamson discloses the use of washcoats comprising cerium plus barium and/or lanthanum to support a catalyst, there is no teaching or suggestion of the other critical limitations of claim 6 arising from claim 1 and pertaining to catalyzed filters incorporating outlet-side membranes. Accordingly, it is respectfully submitted that claim 6 is patentable over the combination of Kondo, Kitagawa, and Williamson, and should be allowed.

Finally, claims 8-9 of the application have been rejected under 35 U.S.C. §103 as obvious from the combination of Kondo and Kitagawa as applied above, further in view of published PCT application WO89/09648 (WO '648). That rejection is respectfully traversed for the reason that WO '648 fails to teach or suggest those elements of claims 8-9 that are absent from Kondo and Kitagawa. That is, none of the cited references teach the combination of a filter with an open pore structure to allow soot penetration in combination with a catalyst in the pore structure and an outlet side membrane to trap the penetrating soot within the filter. Accordingly, it is respectfully submitted that claims 8-9 are patentable over the combination of Kondo, Kitagawa, and WO '648, and should be allowed.

In summary, it is respectfully submitted that all of remaining claims 1-9, 10-12, and 14-16 of this application are allowable over the art of record herein. Accordingly, favorable reconsideration of this application and allowance of all of the remaining claims are courteously solicited.

The Applicants believe that no extension of time is necessary to make this Reply timely, but contingently request that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as is necessary to make this Reply timely, if in fact such an extension is required. In that contingency the Office is hereby authorized to charge any necessary extension fee or surcharge to the deposit account of Corning Incorporated, Deposit Account 03-3325.

Kindly direct all future correspondence in this case to the Applicant's undersigned representative.

Respectfully submitted,



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